

RESIDENTIAL PLANNING STANDARDS
FOR THE URBAN NEIGHBORHOOD IN JORDAN

by

AHMED M. DAKHGAN

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Signature of Author

Department of City and Regional Planning

Certified by

Thesis Supervisor

Accepted by

Chairman, Departmental Committee on
Graduate Students

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A B S T R A C T

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First two sentences of thesis indicate scope of study. Physical planning in Jordan has been only slightly essayed since the Kingdom was founded. At the same time radical changes in population, social customs, and in economy make it imperative that an overall look be taken of the planning standards on which the country should move forward.

The thesis seeks to strike a difficult balance between what the author feels to be minimum standards "for application to create a healthy environment" and an "apparent conflict between what we would like to see happen and what private enterprise as it now operates in Jordan can in fact achieve." The chapter headings themselves reveal the scope of inquiry: The neighborhood unit, dwelling types, standards of occupancy, size of dwellings, density of residential development. In prelude the writer explores the present situation in Jordan vis-a-vis planning, sets general goals, and runs through brief analysis of the social and economic context in which planning must operate.

The writer sets up a model, and proposes specific minimum standards. These may well serve as a beginning, an indispensable kick-off point for further and continued exploration of this delicate task--namely to find ultimate standards at once attainable and adequate.

In brief, the thesis proposes a system of planning for the urban neighborhood in Jordan. The distance between the theory and the achievement may take a little time. The important thing is a goal has been projected and an ideal has been set.

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INTRODUCTION

One of the problems that has received little attention in the past decade in Jordan is physical planning. The country has undergone great changes during the past decade. Population growth was tremendous after 1948; within a very short period of time it trebled in number. This was accompanied by some economic and social growth.

The impact of this sudden growth was severe on the different communities. To accomodate the increase in population urban development sprawled and extended far beyond the built up areas, which at the same time became overcrowded. Urban sprawl was unguided by organized plans and was uncontrolled, resulting in haphazard growth and an agglomeration of land uses creating more problems than before.

The purpose of this thesis is to develop certain standards for planning the neighborhood to be used as a guide. The scope embraced is too wide to be dealt with in an exhaustive way. To do so requires joint efforts of experts. However in this thesis there will be more emphasis on the residential standards for the neighborhood than on other neighborhood elements.

This study deals with the various facts and problems of the neighborhood. It discusses minimum allowable standards for application to create a healthy environment. These standards must be attained to insure a minimum level from the standpoint of health. It should be legally enforced and should be applied to new developments, and should be reached as far as possible in

existing neighborhoods.

Rules and proposals given herein as standards do not represent rigid principles. They are rather proposals given as lowest tolerable minimum to be used as a guide in contribution towards the solution of the planning problem in the neighborhood.

Limitation of data is a handicap to a proper and precise analysis of problems considered in this study. Unfortunately the multitude of data required on population and housing is unavailable. In fact the data are not existing. The little data which are available are inaccurate and unreliable. This causes a difficulty in measuring needs and renders the work more difficult. Hence, the use of the available data is compelling although they are deficient and will result in inaccuracies which could be overlooked until more accurate data are available, provided they are kept within reasonably small range.

I. NATURE OF THE HOUSING PROBLEM

a. Population Growth

The distribution of population in Jordan is a result of the rainfall pattern. People are concentrated in the north-western plateau where there is enough rainfall for cultivation. Accordingly the country is divided into cultivated area and desert area. Nomads live in the desert.¹ The settled people live in the sown area, and they fall into two different groups; rural and urban.

Prior to 1948 there was no official population census taken for Jordan. Hence, it is difficult to trace population growth before that time. However, in 1948 the population was estimated roughly to number 400,000 people. As a result of the Palestine war, and the annexation of the west bank to Jordan the population trebled in number. A number of 850,000 people was added to the original 400,000. Out of the 850,000 there were 450,000 refugees without homes.

This sudden growth in population was a serious problem and its impact is still strong.

The 1954 census shows a total number of 1,402,627 people. The census taken in 1958 shows a number of 1,502,000 people.² The total area of Jordan is 37,000 square miles, the average population density according to 1958 census would be 40 persons per square mile; however, since land under cultiva-

1. 1952 census showed 200,000 nomad population.

2. R. Patai, The Kingdom of Jordan. p.12.

tion is considerably under 2,000 square miles, the density of the planted area would be 750 persons per square mile.

Birth Rate

The 1954 birth rate in Jordan was reported to be 38.4 births per 1,000 people. As some births are not registered especially in the desert and in the rural areas, the ratio might be as high as 40 births per 1,000 people.¹

Death Rate

The 1954 census reported a death rate of 10.4 persons per 1,000 people. The rate in the U. S. A. the same year was 9.2 persons per 1,000 people. This ratio seems to be inaccurate as some deaths are not registered. Undoubtedly the ratio is higher than 10.4 per 1,000 people.

Rate of Growth

Taking the difference between the reported death rate and birth rate, natural increase would be 28 persons per 1,000 people, or 2.8%. This rate is considerably high and will double the population in about 25 years.

Due to the lack of enough data on population, the sudden growth that took place, and due to the unknown future of the refugees as to their settlement, it would be difficult to estimate future population growth and trends.

b. Urban Population and the Urban Setting

The urban people of Jordan include Bedouins, villagers,

1. G. Harris, Jordan, Its People and Culture. p. 26.

refugees and old urban settlers. All contributed to the rapidly growing urban groups.

Most of the population is concentrated in the principle cities and towns which amount to about 18. According to 1954 census, 60.6% of the total population live in six major cities. These cities are:

Amman	with a population of	202,313
Nablus	" " "	161,807
Irbid	" " "	149,023
Hebron	" " "	132,661
Ramallah	" " "	115,548
Jerusalem	" " "	89,833
		<hr/>
	Total	851,182
Total Population in 1954		1,402,627

The Urban Family

The Jordan family is basically, like the typical Moslem family, extended and patriarchal. The family is extended, that is under the Islamic traditional pattern that still prevails in the majority of cities; the family constituting one household consists of the head of the family, his wife, their children, the married sons, and their families. The whole family lives in the same house, or in adjoining houses. The extended family functions as one economic unit. All working members either work together or contribute to the same family fund, so all share family expenses.

However, this economic role of the family is no longer significant as it was once. In the towns, under western civili-

zation influence, and new economic activities there is a great tendency of the split up of this one family.

In the family ultimate authority rests generally in the head or the oldest son. Matters of family policy and decisions are determined by the family head.

Nowadays western influence and modern technological advances and social changes are affecting the family relationships, as well as the Jordanian life, and the patriarchal extended family, and the complete authority of the head is breaking down into smaller groups.

The Urban Setting

The middle Eastern (Islamic) culture is characterized by concentration of activities in towns and cities. The city forms the economic, commercial and cultural center.

This factor caused a constant flow of villagers to towns, and it has been greatly accelerated during the last decade due to employment opportunities offered in the city and to the modern entertainment facilities in the city. A result of this migration from village to town has been the rapid increase of the town population. It created critical conditions such as overcrowding in houses, and a severe housing shortage, and doubling up of families in houses that lack sanitary facilities. It created the problem of water shortage, water needed for domestic use and for construction purposes. Great pressure was exerted on public facilities such as schools.

Despite the uninterrupted flow of villagers to urban areas, the village is not becoming emptied of people because of

the high birth rate among rural people. It is hard to show the number or the rate of internal migration because of the lack of data and statistics on population.

The principle towns in Jordan vary in size. Most of the principle towns have pipes for water and electricity, but these utilities are by no means within the reach of the whole population.

No town in Jordan has grown to metropolitan dimensions. The total population of the country is relatively small, and the largest city has remained below half a million.

The urban pattern of development in Jordan is following the tails of the western pattern, unlike some other Arab countries that maintained the old Islamic pattern where streets are narrow, pedestrian oriented, homes walled from the four sides and where life is behind walls.

Jordan has been greatly affected by western civilization due to its proximity to the Mediterranean shores, the British experience in Palestine and due to the eagerness of its people.

The urban setting in Jordan is relatively new, less than 30 years old. Patterns of development are following new social ideas and new means of life. New social forms and new ways of work compete with traditional ways. Western influence and the problems which came with the trebling of population have engendered focus on the towns.

Now the town is influencing the rest of the society, and the continued development in new economic forms and new social patterns seems to move the town towards western patterns of living.

Class Structure and Social Organization in Town

The Jordanian town up to a late date was characterised by a small number of rich people on one hand, and a large number of artisans on the other hand. Because of religious influence, this did not present any problem that time. It was taken for granted that man must submit to the will of God and that He is the one that gives wealth to people.

With the emergence of larger towns and cities during the past two decades, and the increase in the number of educated people, and with the improvement in working and living conditions, there emerged a new class out of the low class, known as the middle class. Most people that belong to this class are educated people, urban white-collar workers and professionals. This emergence was due to the impact of westernization in the pattern of living.

The basic social unit which is greatly emphasized is the family. The family is the basic social unit, and the larger social groupings (hamoulas) are composed of a number of related families. Kinship and blood relationships form the basis of social organization. Many small towns are inhabited by families that are all related to each other traditionally, an offspring of a common patrilineal ancestor. The families in town group themselves into hamulas, and often each hamula inhabits a definite quarter in town forming what is known as hara. As a result of this hara system, as far as the social contact is concerned, the town functions as if it were formed of a number of units bordering each other where people know each other very well. Another characteristic of the Jordanian town, is the grouping

of minorities; more or less like the hamulas the minorities are also concentrated in haras.

However, today, due to westernization and increase of education, and the disturbances caused by the traditional family and increasing employment opportunities, this inter-family relationship is breaking up, and the strong family ties are weakening.

c. Existing Urban Housing Conditions

One of the most noticeable features of the Jordan economy is the low income of the people, and the inadequacy of housing and public utilities. Detailed analysis of housing conditions is possible only with respect to 1952, the first housing census. This is not reliable however, since the census did not distinguish between one dwelling structure and those containing more than one dwelling, so that it is not possible to establish ratios of persons or families per structure.

However, except in large towns most structures comprise single or two family dwellings. In the principle cities and towns, houses are built of stone and concrete blocks. A considerable percentage is built of mud bricks (See Table 1). The predominant types of dwellings are stone, concrete, mud bricks, and tents. Most houses are small, crowded, dark, and unheated. Roofs are reinforced concrete slabs and mud. Architecture differs from city to city, but mostly it follows the western pattern of design. The building material depends on the raw material available in the surroundings.

More than one-fourth of all housing units in 1952 were not permanent structures. Information on new construction is

Table 1

Type of Construction of Structures in Principle Towns

1952 Census

Principle Towns	Total Structures	Bedouin Tents	Type of Construction of Structures							
			Other Tents	Cave	Wood	Mud	Cement Block	Concrete	Undressed Stone	Dressed Stone
Amman	13,638	1,093	2,878	325	830	1,178	2,129	646	2,693	1,866
Bethlehem	1,863	22	501	54	10	1	2	10	225	1,038
Hebron	2,208	28	29	15	10	1	5	8	158	1,959
Irbid	3,341	50	699	2	111	260	64	18	725	1,412
Jenin	1,481	117	96	22	44	34	8	42	674	444
Jericho	6,695	59	294	1	30	6,245	14	15	6	31
Jerusalem	2,414	5	7	15	18	9	40	37	29	2,254
Nablus	2,934	9	390	130	123	31	14	5	237	1,995
Ramallah	1,788	17	660	—	21	10	6	6	275	793
Tulkarem	2,765	36	913	4	35	12	27	36	893	809

Table 2

Number of Permanent and Other Structures and

Number of Principal Townships

1952 Census

Principle Town	Total Structures	Permanent Structures	Other Structures
Amman	13,638	8,512	5,126
Bethlehem	1,863	1,276	587
Hebron	2,208	2,126	82
Irbid	3,341	2,479	862
Jenin	1,481	1,202	279
Jericho	6,695	6,311	384
Jerusalem	2,414	2,369	45
Nahlus	2,934	2,282	652
Ramallah	1,788	1,090	698
Tulkarem	2,765	1,777	988

Table 3

Total Number of Structures and
Total Number of Persons by Sex in Principle Towns
1952 Census

Principle Town	Total No. of Structures	Number of Persons		
		Total	Male	Female
Amman	13,638	108,304	56,322	51,982
Bethlehem	1,863	19,155	9,529	9,626
Hebron	2,208	35,983	18,387	17,596
Irbid	3,341	23,157	11,813	11,344
Jenin	1,481	12,663	6,376	6,287
Jericho	6,695	41,593	20,727	20,866
Jerusalem	2,414	46,713	23,569	23,144
Nablus	2,934	42,499	21,395	21,104
Ramallah	1,788	17,145	8,490	8,655
Tulkarem	2,765	21,872	10,926	10,946

derived from returns made by municipalities of buildings licensed. However the returns do not distinguish between single dwelling units, offices, shops, etc.

The main cause of housing problems and shortages is the sudden growth of population. In 1948-1949, an area which had housed 850,000 people in East and West bank had suddenly to accommodate an additional 350,000 people. Another cause of housing shortage is the split up of the extended patriarchal families, and the desire of the young married couples to have homes of their own. The housing shortage is acute, and severe overcrowding is prevalent. People live in close quarters, in houses lacking sanitary facilities, and piped water. It is not uncommon for the urban worker to pay as much as one third of his salary for one or two rooms.

The typical urban house of the middle income consists of two or three rooms: a small kitchen, one or two bed-rooms, and a multi-purpose room, used for living, eating, receiving guests, and for sleeping. Not often does the house have a bathroom and flush toilet. These rooms are either grouped around a court, or they are lined up fronting the street, with little open space. The number of people that occupy such a house may reach eight to nine persons. In contrast to these houses, the homes of the high income group are of modern design equipped with modern electrical appliances and sanitary facilities.

The present housing condition in general does not fulfill the simplest requirements of decent living. A great many of the towns have no piped water. About 75% of houses have no flush toilets nor bathrooms. Hot running water is completely

non-existent. There is serious over-crowding, and the level of rents is high.

Housing supply is far below the demand of population; it does not meet the need of a fraction of the increasing population. Construction is undertaken by private individual capital, which is too poor to pay for the expensive construction material. Neither the central government nor municipalities construct housing for low income groups. This is an unknown field in Jordan.

It is clear then that the housing problem is of a complex nature and is due to many factors, -cost of material, cost of land, cost of public facilities, and most important of all lack of investment capital.

d. Existing Urban Public Utilities

Facilities for water supply, sewerage and streets are even less adequate for the needs of the country than housing. A great number rely for water on storage from rainfall in private cisterns, and some depend on springs. Even most of the houses that are connected to the piped water system are unable to draw water during the dry season. One or two cities have partial sewerage and drainage system. The existing sewerage facilities, mainly septic tanks, present great danger to water sources. Water sources of many towns are already polluted by the underground sewage water absorbed by the soil. There is complete lack of drainage systems almost in every city and town. Storm water gathers on the streets, and sometimes causes damage to property. There is no place for rain water to go except to flow on streets and accumulate in stream beds if there

are any.

The streets are inadequate for cars and for pedestrians. There is no protection for the pedestrian on the street. Street surfaces are for people, cars, and for rainwater. In hilly areas, the design is not adequate. Contour lines are not followed. Gradients in some cases reach 15% - 18%. Besides this, not all the streets in most towns are paved; a considerable percentage are dirt roads.

Open spaces, playfields, and public parks are inadequate. In fact most towns do not have such facilities. Even schools in some towns have no playgrounds. As the towns are very small, and the open space outside the town limits is within easy walking distance, these open spaces, even though they are private lands, are used for play purposes and for recreation.

Schools are insufficient and inadequate too. There are not enough schools to accommodate the increasing number of pupils. There are no standards for the number of pupils for a school, nor for playgrounds and playfields. Class rooms are overcrowded, and the space provided for schools is insufficient. In the same way, school distribution is not adequate. Quite often, school children walk miles to get to their schools.

e. Lack of Planning Standards

In Jordan there are very few planning agencies, and these are attached to the municipalities of each town and city. There is no central planning agency to formulate planning goals, policies and to adopt the necessary standards for planning. Even in the few municipalities that have planning offices, correct measures of planning are not taken because of the lack of skilled personnel. In these offices, planning regulations have very poor standards in zoning regulations, building regulations, and development control

. For such reasons, development in urban areas, due to population pressure spread uncontrolled and unguided by any sort of studied plans. The result was clear: inadequate and unsanitary housing, mixed land uses and densities, and development of open land for residential purposes went on without reserving sites for schools, open spaces, public parks, etc. There are no such planning standards at the present time to measure the quality, value, or degree of adequacy of the present conditions of housing, or public utilities.

To evaluate the present conditions and to be applied to new development as well, guidance standards for the lowest tolerable minimum, which must be attained to insure a minimum level from the standpoint of hygiene and health, must be adopted.

f. Lack of Statistics and Data

Although there is a bureau of statistics in Jordan, attached to the ministry of economy, its statistics and data are not sufficient. It does not have all the information required for the planner. This is due to its lack of experience and unavailability of skilled personnel.

Population census was taken for a few times since 1952. However, it is not in enough detail to show population composition, age and sex, marital status, school population, and population trends and forecasts.

In the same way the housing census is poor. To develop any housing program important statistics are necessary, which at the present time are not strongly stressed. Such information as number of dwelling units and households, number of people in each household, condition of the structure, type of structure, and condition of housing facilities, plumbing, sanitation, etc. is not available. The economic status is not shown in detail, as income of the family, distribution of income, types of employment, etc.

These three types of information are necessary for the planner to study and to use as a guide, instead of crude assumptions which might not show the facts. A proper and precise analysis of the problem considered in this thesis requires a multitude of data, as has been mentioned before. Unfortunately they are not available, and the little informa-

tion which is available is inaccurate and unreliable. In fact most of the information necessary is not existing.

II. UNDERLYING CAUSES OF THE PROBLEM

a. Low Standards of Living

The general living standards in Jordan reflect the general economic conditions. The whole economy of Jordan is based on and depends much on foreign aid and thus is non self-sufficient. The country compared to its economic base and resources is overcrowded. There is a serious housing shortage. The present conditions do not encourage a healthful life. Sanitary facilities are inadequate, and rents are very high compared to the average income of the urban worker. The average family income is very low to meet the basic daily needs and expenses. Public utilities are even in worse condition; public funds are too short to meet improvements. All of these factors, combined with another major factor, which is the high percentage of unemployment and high cost of living, render urban living conditions extremely difficult and unhealthy.

b. Rapid Increase of Population

The trebling of Jordan's population within a period of one to two years, due to the annexation of the west bank to Jordan, and the influx of refugees were major factors in bringing up these staggering conditions. The country was not prepared at all to accomodate such tremendous increases. Overcrowding was inevitable, also shortages in housing, community facilities, and heavy unemployment resulted. Urban expansion was inevitable to shelter the increased population, and public facilities, such as schools, had to be provided at once to meet the increased demand. Emergency measures taken to provide shelter continued to be per-

manent regardless of substandard conditions.

c. Lack of Control of Development

Urban expansion was not guided at all according to an over-all policy or plan. Actually there was no time for that, and in addition there were no people to draw such plans. Urban sprawl was hazardous, land uses were mixed, densities not controlled. At the present time there are very few towns that practice control over new developments; however that is extremely difficult as there is lack of legal basis for such control, and it is not effectively carried out.

d. Economic Status and Size of the Family

It is very difficult to get accurate sizes of the average urban families, as they differ from one locality to another. It depends on birth rate, death rate, and other factors. Also accurate information about population is not available. So far in Jordan the population census has been taken twice, and the census figures are not in great detail. According to the 1954 census the average number of children born to a married couple was between 9 and 10 children of whom about 6 reached adulthood.¹ On such an estimate, even if it is not accurate, an assumption of the average family size could be made. It will range from 5 to 7 persons; however, the writer feels that a number of 5.5 would be quite reasonable.

It is hard too to figure out the average family income.

1. R. Patai, The Kingdom of Jordan, p. 136.

The population census does not indicate the economic status of the family. Table 4 shows monthly income of the urban worker.

Agricultural labor wages are far below those of urban industrial or skilled labor. These figures do not represent the family income. Family income depends on the number of workers in the family. As the families are large, it is quite likely that there is at least one adult working in addition to the head of the family. If the financial condition of the family is bad enough, there might be two members other than the head working. On such a basis the average monthly income of the family in the low income group might range from 20-25 Jordan Dinars, and that of the middle income group might range from 30-40 Jordan Dinars. These assumptions stand only in case there are one or two workers other than the head of the family. However, as there is heavy unemployment, the possibility of having two to three workers in the family is not great. Table 4 more or less represents the monthly family income.

For the middle income group, the rent of a house composed of two bedrooms, a living room and a bathroom ranges from 8 to 10 Dinars a month. This amount is almost equal to one-third or almost one-half the monthly income of the urban worker. The middle income group constitutes skilled labor, white collar, educated people.

For the low income group, a house of three rooms without a bathroom, but with a toilet costs about 6 to 8 Dinars per month. This is equal to almost half the monthly income of the low group worker. For that reason the majority of low income groups live in one or two room houses, no matter how big the family.

Table 4

Gross Monthly Income in Dinars
of Selected Jobs in 1955¹

<u>Unskilled Labor</u>	<u>Dinar</u>
Messenger	10.00
Watchman	14.00
 <u>Skilled Labor</u>	
Carpenter	20.00
Driver	20.00
Mechanic	22.00
Mason	24.00
Electrician	25.00
Foreman	36.00
 <u>White Collar Occupation</u>	
Typist	20.00
Nurse	20.00
Stenographer	30.00
Clerk	22.00
Accountant	35.00
Surveyor	35.00

One Jordan Dinar = 2.8 U.S. Dollars

1. Int. Bank of Development; Economic Development of Jordan, p.453.

Of course wages differ in the different towns, but generally the mentioned figures in Table 4 could be considered as average wages. Hence, as a conclusion the average income of the low and middle groups is far below the requirements to provide good living.

III. NEED FOR PLANNING STANDARDS

a. General Goals

Under the circumstances which have been mentioned, the great need for planning the community is quite evident. To create healthy people, there should be first healthy homes and adequate public facilities which would help to promote the development of healthy communities. Thus, the general goal for planning is for creating healthful and livable communities. This is achieved through the provision of livable houses and community facilities such as schools, public open space, etc., which are prepared according to sets of rules and standards based on the needs and the present local conditions. Such standards will be the guide for healthy developments.

b. Approach to the Problem

Under the prescribed conditions, and due to the difficulty of obtaining the required data, the approach to the problem is rather difficult.

In order to approach the problem intelligently, planning must be based on fundamental information if it is to be both valid and economic. It is necessary to obtain accurate information on population, composition by age and sex, number and characteristics of families, and their income, housing conditions and requirements.

Studies must be made of the minimum standards of accommodations which would be permissible under the existing conditions so as to insure decent family living. This is the scope of this thesis. It is a wide subject. However, the most important aspect of community planning will be considered herein.

The writer is familiar with the conditions and problems of Jordan in general, and with the help of the little information and data which is available, (as most of the required data are not yet developed) will make necessary assumptions within reason. The assumptions will also be compared to and based on similar experiences in the same field. However, the problems are complex, and it is not expected that fast rules can be worked out easily and be adopted as recommended standards. But it is hoped that the analysis of the different elements involved in the subject will put some high lights on the important factors which must be regarded highly in the formulation of basic standards.

It becomes clear then, that the chief purpose is not that of establishing environmental planning standards from the ideal point of view, but those which will fit into the present pattern of living, with high regard to the present situation, and which will be within the economic means of the community, thus serving as a guide for community development.

IV. GENERAL OBJECTIVES

The development of community planning standards is very necessary, as they are laid for the sake of guarding the physical, mental and social health of the community. They are needed to guide new development and to serve as a measure for the existing development. Such standards include standards for housing, for densities in residential development, and for all the public facilities such as schools, shopping, open spaces, public parks, public buildings and playfields, and the related facilities.

The objective of housing standards for planning is quite obvious. It is to help in guiding housing development according to bases that will insure healthful living places, to measure the effectiveness of present housing, and to help formulate housing policies. No rigid housing standards can be developed in great detail to conform to all localities. What is regarded as adequate minimum in one place might be unsatisfactory in another place depending on levels of income, economic situation, cultural values, and geographical nature.

It is of no less importance to consider the other aspects of community facilities. Schools are very important. Its quality physically bears great effects on the health of the pupils. Hence it is necessary to organize school occupancy in class rooms, in playgrounds and playfields to promote the physical health as well as educational standards. The same thing holds for other facilities.

Defining a good community as a good place to live in is not enough, but it depends on the condition of different, physical constituents of the community. What determines whether a

neighborhood is good or bad is based on the extent to which it meets the conditions which are effective tools for the promotion of human physical, mental, and social welfare. So, by developing standards on which to base the planning of these various elements of the community, the main objective is to create a livable environment and a healthy community.

V. THE NEIGHBORHOOD UNIT

a. The Existing Neighborhood Concept

The present concept of the neighborhood as a self-sufficient unit does not exist in towns and cities in Jordan. Instead there is the hara pattern, which actually takes the place of the neighborhood. Each hara is composed of a single main street around which the extended related families live in groups of houses, and usually the street and the hara are named by the name of the family that occupies it. The hara may extend to be comprised of other minor streets around which other related and unrelated families live. So, it is common to find a whole district or sector of a town or a city inhabited by such related families and known by its name, thus forming a social nucleus of its own.

The typical Jordanian town consists of several of such haras and sectors bordering each other and forming parts of a single whole community. Consequently, the urban setting tends to be distinguished by such sectors or neighborhoods (using the right terminology).

Social activities are carried on within the framework of the hara. In a typical traditional hara, there is a common guest house known as Madafa which usually belongs to the chief head of the related families. The Madafa, or guest house, is open for everybody. People meet there daily around the coffee pot and fire to discuss their own affairs and spend their spare time there.

Shopping is within the hara; there are few shops located in each hara and sector to provide the people with their daily needs. Seldom do they go to other shops unless what they need

is not found in their sector.

Recreation places, such as parks and playgrounds have no place yet in the sectors. Very few places have such facilities. What is used as a playground by children may be an empty lot or a large square. School playgrounds are used if they are nearby. Otherwise, open fields on the outskirts of the city or town are used as playfields.

Schools do not follow the pattern of hara or sector. There is not a school in every sector; they are common for all sectors. Pupils often walk more than a mile to get to the nearest school.

Housing types in the sectors vary from one locality to another. In older towns and cities, the traditional courtyard-enclosed houses, or the lined-up houses fronting the street enclosed by walls is prevailing. In bigger urban areas, housing types are of different character. It is closer to the western type, rooms are gathered around a living room or a main hall, with a small back-yard and a small front garden. It is difficult to draw a definite line as to the preferences of housing types. It depends on the background of the family. The modern urban settler prefers the modern western type house. The dweller of a smaller traditional city prefers the courtyard house. However, the existing conditions of either type are not adequate for good living standards.

Population of the hara and the sector varies. In a typical small hara, population numbers from 20 to 25 families. A good sized one may have about 50 to 75 families. A sector generally contains twice or three times the number of people in

a hara; it might reach up to 200 families. It is not easy to give accurate numbers as each sector varies in size considerably.

The overall area of these sectors varies according to the number of families and types of dwellings and densities. Usually buildings are of one and two stories, crowded or grouped together around certain community facilities, such as the souque that is, the local market.

This type of pattern in general prevails in the older traditional towns. But in the bigger cities and new urban areas it is breaking down, due to increased education and western influence, and partially due to the breakdown of the extended related families into smaller groups and smaller families.

b. The Neighborhood as a Planning Unit

There is a general wide agreement among planners on the definition of the neighborhood. The main theme is, "the neighborhood is a planned community around an elementary school, self contained with respect to the basic needs of family life, and forming a unit with identified identity, and related to the larger whole of the community."¹

This neighborhood concept has a fundamental function, or purpose, for the development of family life, and for the growth of desirable human ideals that lead to the stability of the community.

It is an urban unit with a functional arrangement of its elements which constitute the neighborhood environment.² Such elements are residential facilities, schools, circulation system,

1. Clarence Perry, Regional Planning of New York

2. V. J. Kostka, Neighborhood Planning, p.9.

educational and community facilities. This unit is planned for the population of an elementary school service area, which is limited in terms of size and population. As standards for environmental elements need the consideration of each of these elements, it would be rather impractical to consider them separately. There should be a unit which binds these facilities together geographically to be regarded as a unit base for the study of developing planning standards. The neighborhood unit provides this planning unit. This unit will permit organization of its physical elements. Besides, it is the smallest complete unit handy to the planner, and it is the smallest housing unit which includes all the basic facilities for family needs.

However, this unit may vary in size in the same urban area according to the type of density. The determining factor or criteria for the size of this unit is that of a physical character, since the neighborhood physically is primarily concerned with distance to the different facilities within it.

c. Size of the Neighborhood

The size of the neighborhood depends upon many factors of different nature. Factors that govern the neighborhood size are population size to support an elementary school, allowable walking distance to school and to other neighborhood facilities, area required for the different land uses, density of population, cultural pattern and topography.

We cannot establish an area on a single criterion and proceed forming a predetermined size. It should be realized that economic factors play an important role in determining the size. The economic base of the community might not help support-

ing a school and other facilities in a neighborhood whose population is based on the number that will provide enough school children for one school.

Actual size, then, will depend upon economic base of the community, family income, population density, transportation pattern, and cultural pattern. As the neighborhood concept is based on the elementary school service area, accessibility to the different facilities within a short walking distance of 15-20 minutes, or a maximum of 25 minutes is of primary importance in determining neighborhood size.

d. Population of the Neighborhood

Considering the neighborhood based on the elementary school, then the population of the neighborhood would be that number to provide enough school children to support an elementary school. The number of pupils in an elementary school varies according to different local and economic conditions.

The elementary school grades in Jordan are from 1-6, and the secondary or high school is from 1-5 grades. These two stages are preceded by 1-2 years kindergarten. In the elementary school, the adequate number of pupils per classroom is 30 pupils, however under economic conditions 35 pupils per classroom would be allowed.*

The size of the school varies from the standpoint of economy in land cost, construction cost, maintenance, supervision, and administration. A school of one room for each grade, with 30-35 pupils per class would seem rather uneconomical, accomodat-

* At the present time the number of pupils in a classroom ranges from 40-50 pupils in Jordan.

ing 180-210 pupils. A school of two rooms for each grade would be more economical in terms of the above mentioned factors. This would accommodate 360-420 pupils. Evidently, a population to provide 360-420 children for elementary school will be too few due to the big size of the average family in Jordan. They will not be able to support the school and other neighborhood facilities economically. Then, either the school should have more than two classrooms for each grade, or another school of the same size should be built to increase the population of the neighborhood.

The latter solution is valid. Because of the sex segregation in education in Jordan, for each school for boys there should be another for girls. Then the conclusion is that the neighborhood must have two elementary schools, one for boys and the second for girls. This will accommodate according to two rooms for each grade 720-840 pupils of both sexes.

Assumed Family Size and Age Distribution

Table 1

1. Average family size 5.5 persons.
2. Average distribution served by neighborhood school

Children by School Age Group	Children Per 1000	Children Per Family
Kindergarten 5-6 years	16.5	.09 ¹
6 Grade Elementary 7-13 years	127	.7 ¹

1. Based proportionally on APHA, Planning the Neighborhood, p.4. Table 1 with slight increase.

From the above table, the number of people that would provide 720-840 pupils for the two elementary schools would be about 5600-7050 persons or 1018 to 1280 families.

From the previous discussion on the present neighborhood concept in Jordan, it becomes clear that the modern self-sufficient neighborhood concept around the elementary school is quite feasible to imply under the present conditions.

The different haras which comprise sectors (which previously I called neighborhoods) are already set quite close to such a concept. Providing the nucleus points (schools) and neighborhood public facilities, and grouping the different sectors around these facilities will bring up the self-sufficient neighborhood.

VI. SITE - SITE SELECTION REQUIREMENT

Suitable sites for urban housing are of different nature and character. Sites differ according to the nature of the place and district in which they are situated. To select a site for residential purposes, careful consideration must be given to certain elements, and must be fulfilled as much as possible to render the cost within the means and ability of the people who are going to settle in the area. The elements that should be taken into consideration are of different nature. Of course, there are no ideal sites, certain remedial measures should be taken within the allowable economic range of the overall cost of development to prepare the site for building.

a. Physical Characteristics

The following factors should be considered to obtain sites that can be developed, and are free from excessive development cost.

1. Topography

The topography of the area must be smooth enough to permit efficient development. Sites of rough topography should be avoided, such as steep hills and steep valleys, irregular terrain, and land slide areas. The topographic nature shapes the whole man erected developments and determines its adequacy. The spacing of buildings, the flow of utilities, cost, and the gradient of the streets will be greatly affected.

Most of the Jordan urban areas are of hilly nature. Private development in some cases is carried on sites of more than 20% slope, which renders accessibility by cars very difficult, and

requires pedestrian steps. Development of such steep sites adds more cost to building construction and to public utilities. Besides, it is inadequate for playgrounds and playfields. Development of such steep sites should be discouraged. A site of 12% slope as maximum would be more reasonable; it is within maximum reach of cars. This, however, would be allowed in case of unavailability of relatively flat land. Slopes of 4%-6% would be more desirable and less costly. Hence, the nature of topography should allow the adequate use of the area for housing, open spaces, and circulation within the reasonable economic cost.

2. Soil

The condition of the soil must be such as to permit economic construction of building and facilities.¹ Sites of soft ground and fill should be avoided as they are expensive to develop, and for its inadequacy to support structural foundations. Also, sites of rocky nature or rocky surface should be avoided as they are expensive to excavate.

A study of the soil and subsoil characteristics will be a good idea to reveal its adequacy. Surface soil should be able to support plant life for gardens.

3. Drainage and Ground Water

The site should be clear from accumulated storm water, marshes, and must be naturally drained. Sites subject to flood water should be avoided. It should be certain that ground water table is low enough especially in river basins, so as not to cause damage and dampness to structures. If the water table is high, it

1. Environmental Standards for Residential Areas, APHA.

will add cost to excavations, through sheeting and pumping.

It is necessary to establish a network of storm sewer pipes underground to prevent accumulation of rainwater on streets. In new developments such pipes could be connected to existing pipes. However, where there are no storm sewage pipes already existing, it is necessary to establish first main lines to divert into them new subsidiary lines, at the same time to complete the whole network within the already built up areas. New streets should not be paved by municipalities unless storm water pipes are laid first in the streets.

4. Freedom from Hazards and Smoke

In selecting a residential site, areas that are known to have land slides and settlements should be avoided. Factors that cause fires, explosions should be far from the site, and the site itself should be clear from such things.

Smoke and industrial odors cause great harm as they affect health and render the site value less for residential development. However, at the present time such elements do not present danger as the country is not industrialized, but there should be protection against this danger. Sources of smell such as slaughter houses, distilleries, and food processing factories should be kept out of residential sites, and placing them out of wind direction to the area will help greatly to minimize their nuisances.

5. Freedom from Noise

The residential site should be of a quiet nature, away from sources of noise, such as railroad stations, quarries,

and industrial plants.

However, not all noises can be controlled. Traffic noises on streets are difficult to control, but it becomes an accustomed noise. It is the noise that happens occasionally that disturbs, such as factory whistles and airplane noises. Noises that cause irritation to people, of high repetitive nature should be kept out of residential sites.

Mixed land uses that cause mixed activities are the sources of undesirable noises in built up areas. Such sources should be taken out of the existing residential areas gradually to designated places to eliminate noise.

b. Accessibility

1. Accessibility within the Neighborhood

The Jordan communities are mostly pedestrian orientated. Limits of time to be consumed walking to destinations within the neighborhood should be mostly based on walking time, rather than distance alone, as walking up and down hills is not as easy as walking on flat terrain.

Walking distance to elementary school should be within $\frac{1}{2}$ a mile and about twenty minutes walk. In the same way walking distance and time to the other neighborhood facilities should not exceed those limits. However a walking time of thirty minutes as maximum is acceptable, as sloping roads and pedestrian steps need more time to climb.

This does not mean the elimination of vehicular circulation and streets. Easy flow of circulation is necessary within the neighborhood, avoiding dangerous crossings, and avoiding streets of slopes exceeding 12%. Pedestrian walks exceeding

10% slope should be turned to steps to be more comfortable in walking.

Using cars for commuting within the neighborhood is not so common; even commuting school buses within the neighborhood are not often used. Walking distance limits will convey to car commuters anyway, and within less time.

2. Accessibility to the Neighborhood

The residents must have easy access to the different parts of the community outside the neighborhood limits. Access to places of work, central shopping, and main business districts is necessary. Much of the adequacy of the site will depend on the access, distance, and cost of commuting to the site.

Means of commuting in Jordanian urban areas are automobiles and buses. For automobile access there should be adequate paved roads linking the site to the different parts in the city. In the same way pedestrian walks separated from vehicular streets should be provided between the different adjoining neighborhoods.

c. Availability of Public Utilities

1. Water Supply

One of the gravest problems in Jordan is the scarcity of water, especially during dry seasons. It is important that the selected site have adequate water supply delivered through pipes. It is very difficult to set standards for water consumption, as water depends on rain which varies greatly from one year to another. However, water supply must meet adequate domestic consumption. The water itself on the other hand should

be pure and free from organic impurities.

So, in selecting a residential site provision of piped water is necessary; if the present water supply is not enough, new water sources should be found.

During the dry season, in most cities water is rationed in terms of time. To allow availability of water within the house for domestic use, it would be recommended to establish reservoir tanks on the roofs to keep enough amount of reserved water for daily use. These tanks would be filled during the ration hour and before water is cut off from the neighborhood.

2. Sanitary Sewer System

Another major problem in Jordan cities is the lack of sewer system. The present system used is the septic tank and cesspools. Both cause water pollution. In many cities water is polluted from sewage material which is absorbed by the soil, especially around water catchment areas. It is of the utmost necessity to establish sewerage systems, and the need is urgent. But the economic base of the different communities does not help that at the present time. However, the solution would be to establish sewerage system in the water catchment areas first, where it is most urgently needed. This would be connected to the treatment plant by major lines. At the same time new development areas could be connected by subsidiary lines, through the built up areas, giving them priority to the already built up areas, to save effort and cost of septic tanks. Later on, gradually, the system would be extended to include the whole urban area, giving priorities again to places that are closer to water

catchment areas.

In the long run this will save the community many troubles and eliminate the use of the unhealthy septic tanks and cesspools. However, during the process of establishing the first stages of the sewerage system as described above, the use of septic tanks in new developments should be allowed. The above mentioned way may reduce the initial cost of the sewerage system, and bring it within the economic ability of the municipalities.

3. Garbage Disposal

Accumulation of garbage should be avoided in the neighborhood as this tends to create unhealthful conditions and diseases. Garbage should be collected by municipalities at least once a day, as the hot nature of the country makes it easy to cause decay of garbage in a short time. The place of garbage disposal should be far enough from the site, and it should be burned or incinerated.

There are other factors that should be considered in selecting the site for neighborhood development. However, the aforesaid factors are the most important ones. Other minor factors could be overtaken, or brought to adequate use within reasonable cost.

VII. DWELLING TYPES

Provision of different dwelling types in housing is necessary to accommodate the different cross-sections of family types and individuals. Diversified dwelling types, such as single family, double family, and multifamily dwellings are required. This in turn requires a careful analysis and classification of families according to types and sizes.

In Jordan there are two prevailing types of dwellings: first the western dwelling type, either single, or double family house. This type is common in bigger cities, and the urban dweller under western civilization influence prefers this type of housing. The second type is the traditional courtyard house, which is mostly single family dwelling. This type of dwelling is more common in smaller towns, and the old traditional families prefer this type of dwelling. However, the tendency during the past decade has been in favor of the western type of dwelling, the compact house where rooms are gathered around a main hall or a living room, instead of being gathered around an open court.

1. The single family dwelling

It is agreed generally that the free standing single family detached house has all the advantages of family life; it provides complete privacy and provides most satisfactory conditions especially to families with children.

The semi-detached single family house, with a common wall, provides the same advantages as the single detached house, but does not provide the same degree of privacy. In terms of density the semi-detached house allows more people at a lower cost than the former one. Both types are very convenient for good living conditions, but imply high cost and low densities.

The single family dwelling type is not so common in Jordan. People of the upper income groups and few people in the smaller towns live in such dwelling types. Reasons are mainly economical; the owner adds another story for a second family to benefit from the rent.

2. The Two Family Dwelling

The two family dwelling is either detached with two floors or semi-detached with two floors. Those two types do not have the same advantages and merits as the single family dwelling and do not provide the same privacy. This type, however, allows higher densities at lower cost and saves land area.

The family that lives on the first floor has the advantage of being closer to ground and garden and does not have to climb stairs. These two types are in more common use in most urban areas in Jordan. It is easier for the property owner to add another story saving land cost rather than building on another lot. The two family semi-detached is more common in the bigger cities where the housing shortage is greater.

3. Multi-Family Dwellings

Multi-family dwellings are either high apartment buildings exceeding three stories, or row houses up to three stories, where elevators are not needed.

The high apartment buildings have many draw-backs, as lack of privacy, improper cross ventilation, stair climbing and noise. Such apartment buildings are appropriate for certain types of families, such as young or old couples. Even with all the draw-backs apartment buildings become a necessity to justify

high cost of land and to provide for high densities in heavily developed areas. Its advantages are economy in land, economy in streets, and that it allows higher densities. This type of building is rarely used in Jordan. Very few cities have apartment buildings exceeding five stories. The reason for that is that housing development depends entirely on individual private capital, and apartment buildings imply extensive investment; the individual builder is not able to provide the required capital for investment.

The two-three walk-up row houses are more favorable for dwelling and are more convenient than the high apartment buildings. This type in its broadest sense is not quite common in Jordan; however there are row houses up to ^{three} stories high, but they are individual groupings and do not extend to the whole block length.

Both of the previous types present economy in cost; they save land cost and also save in sanitary facilities and in construction cost. However, the obstacle to such development is lack of investment capital.

One type of housing which proved to be successful for low income groups in some neighboring Arab countries is the one story court-yard row house. This type of dwelling provides almost a pattern similar to the old traditional courtyard houses in the smaller towns. It provides a private court which is very useful for family social activities within the home. However, this type of housing has not been known yet in Jordan.

The reasons for housing problems in Jordan have been mentioned previously. The reasons for the lack of different types of houses are mainly because of the shortage in housing

and because housing development depends on the individual private capital. The individual builder builds houses that will suit his budget. He is unable to build except one or two dwellings, either single or double family type. The tenant has no choice of accepting or rejecting the house or the type of the house. He has to take what he finds because of the housing shortage, and because that type is the only one available in the housing market. So housing types are not really based on the needs and desires of the tenants, but rather based on the limited budget and desires of the builder.

In general each type of house has its own merits and disadvantages. But in housing development application of each type becomes a necessity to meet the needs of the different families and also for aesthetic values. In selecting housing types care should be given to selection, so that people can be allowed to live according to their habits, traditions, and desires.

In Jordan the duplication of the western designs led to the neglect of the traditional old courtyard house which fits the social pattern. This type of house provides three elements necessary to the oriental family:

1. Complete privacy
2. Shaded semi-enclosed space
3. The internal court or patio for family use.

Even realizing that this is the best type of house, it is difficult to supply all the families with such houses, because of its high cost, low densities, and because of some of the people that are fed with western ideas and prefer western

types of dwellings.

4. Criteria for Selection of Dwelling Types

a. To Meet a Cross-section of Family Types and Sizes

The families of a community are of different types, sizes, and composition. So, in order to create a livable neighborhood with permanent people there must be diversified dwelling types. Such task requires a careful study of the present and future trends of population, number of families, and their compositions, and classification according to sizes. A settlement based on such studies would create a homogeneous family pattern with enough space for each family.

b. Relation of Dwelling to Density

"The selection of dwelling types must be related to the densities of building required to distribute total land cost among families, and to the maximum densities which must be imposed on each dwelling type to protect the fundamentals of livability; light, air, and usable open space for daily needs."¹

Careful distribution should be taken into account to insure the maximum benefit in land development. Land of high value should be of high density to distribute the cost to the minimum possible for each family.

c. Relation to Topography

It was indicated previously that land for residential development should meet certain conditions. However, where land is not relatively flat, the designer should be careful in adapting the building type to fit the contours to minimize

1. APHA, Planning the Neighborhood, p.28.

cost. On sloping sites, it would be preferable to have building lots and buildings with small depth to avoid excessive excavations and extra cost.

d. Relation to Cost and Income

Cost of raw land, and cost of development of the land is a significant factor in determining size and type of building. Land should be utilized according to its cost to bring housing cost within the economic means of the family. The total cost of dwelling must conform to the cross-section of family income.

VIII. STANDARDS OF OCCUPANCY

Standards of occupancy for dwellings are necessary for the purposes of safeguarding the health and comfort of the occupants of the urban dwellings.¹ Occupancy standards are necessary to determine the relationship between the occupants and the dwelling and the relationship of the number of occupants to the different units in the dwelling.

To determine such standards, a thorough knowledge is necessary about the family composition, age, sex, size, and relationships. Such information should be based on correct population census, population growth and trends. These are necessary to arrange to meet the needs of different families, needs for the present and the future. Also the study of family habits and trends, and the change in living habits and social patterns is necessary.

Criteria for determining such standards are:²

- a. Minimum space per occupant of a dwelling
- b. Minimum air space per occupant per room
- c. Minimum floor area per occupant per room
- d. Maximum number of families permitted to occupy a dwelling
- e. Maximum number of persons to occupy a bed room or a room.

Standards based on such criteria cannot be rigid; they should be flexible as conditions requiring the minimum allowable standards vary. The type of family and the function of the family itself have great effect according to their needs on the permissible standards.

1. U.N. Minimum Standards of Occupancy and Fitness, p.7.
2. Ibid.

1. Room Composition and Relationship

The dwelling unit is composed of three main categories, namely:

1. Sleeping quarters
2. Living and reception quarter
3. Service quarter.

Each section has its definite functions. In planning the dwelling care should be taken as to the distribution of these different elements in order to achieve their function effectively.

Also, certain principles should not be forgotten:

- a. Rooms should be planned to admit daylight and sunlight in winter time through proper placing of openings.
- b. Rooms should be planned to allow performing their function and proper distribution of furniture.
- c. Proper ventilation should be achieved in the plan.

Circulation between various elements of the dwelling should be planned efficiently to provide privacy, avoiding using rooms as passageways to other rooms. Direct access from one part to another part performing another function should be avoided, such as direct passage from kitchen to bedroom. The service area should be placed within the dwelling as far as possible from the sleeping quarter and must have a rear access.

There are basic desirable relationships regardless of size, which must be achieved in order to produce a house plan that works.¹

1. A.P.H.A. Planning the House for Occupancy, p.45.

Basic Desirable Relationships of Rooms (Inside)

- | | |
|-----------------------------|--|
| A. Location of rooms for | 1. Circulation between rooms |
| B. Orientation of rooms for | 1. Adequate daylight
2. Proper ventilation
3. Protection from weather and sunlight |
| C. Visual privacy from | 1. Baths, entrance |
| D. Noise protection from | 1. Kitchen activities, children indoor playing |
-

2. Number of Rooms in the Dwelling Unit and Number of Persons Per Room

It is not possible to set a criterion to calculate the number of rooms in the dwelling unit. Households differ in number, composition and occupation. The provision of adequate number of rooms requires the study of the cross-section of families in order to be able to provide their needs.

A family composed of two persons requires one bedroom, a family composed of four persons requires two to three bedrooms depending on the age and sex of the children. The size, composition, age and sex determine the size and number of rooms in the house.

In bedrooms, for the safeguard of health and privacy not more than two people should be allowed to sleep in. Parents use a single room. Two children may use a single bedroom provided they are of the same sex and age. Otherwise, each adult child should have a separate bedroom, to insure health, privacy, and social values. The age at which sex separation is drawn varies according to nature of people, climate, and race. However, the age of nine to ten years would be a reasonable age for separation.

Actually what determines the size of the house are the bedrooms. Bedrooms should be provided for all members of the family separately if required. However, this is not possible at the present time. Under the present circumstances in Jordan the average middle income family cannot afford the rent of a house containing three bedrooms, nor can the low income family afford that. The prescribed standards cannot be met in this case. Then what would be the solution? This question will be answered in a later chapter.

However, that does not mean that we should give up the recommended allowable minimum standards, nor to go far beyond what would be least convenient to human public health and welfare. Such standards are necessary as a guide to healthy community development. Whether the community can afford standards, when going below them will endanger public health, is an entirely different problem and requires different treatment.

3. Sizes of Rooms, Bedroom, Living Room, and Kitchen

In determining the minimum size of a room, to insure livable conditions the following have to be considered.¹

- a. Health - insurance of enough cubic feet of air per person
- b. Social - insurance of enough space for living conditions and privacy
- c. Economic - cost in relation to the size of the house.

Every room in the house should have enough room to allow movement and spacing of furniture and fittings. This is necessary for the fulfillment of the function to which the

1. Report of Australian Housing Commission, 1949, p. 91.

room has been designed.

The minimum area will vary according to the function of the room, type and size of the dwelling, and also the number of occupants. Prescribing a minimum area for a room presents certain difficulties. The minima prescribed cannot be taken as a rigid figure, and it is subject to variation depending on the nature of the room. However, such a minimum is necessary to attain livable conditions for the occupants of the dwelling.

Considering the main quarters of the house, the main rooms would be 1. the bedroom, 2. the living room, 3. the kitchen.

The Bedroom

The floor area of a bedroom depends on the age, number of people that sleep in it. A bedroom for a single person must provide sufficient space for the furniture required: bed, table, chair, and reading space. The most important factor in a good bedroom layout is the proper wall space for beds and easy circulation. These two factors are determinants of area required.

Experience has shown that a bedroom for a single adult, with a minimum width of 2.5 m is seldom satisfactory, for occupancy from the point of view of allowable space for furniture, circulation, and psychological feeling. A room with a width of 3, 3.5, 4.0 ms is much more comfortable with an area ranging from 9 sq. ms to 10 sq. ms. for a single person.

Another factor which affects the area of a room is the type of climate. In a hot country more air is needed in the room and should be allowed to circulate.

A bedroom for a single person varies in size, according to the age of the person, whether it is an adult or a child. However, what is adequate for an adult will be adequate for a child, but not vice versa.

On such bases, it is hard to judge on area standards, considering all the factors that are involved, including the economic factor.

As it has been indicated before, a minimum width of 2.5 m - 8.25 ft. for a single bedroom is insufficient. A width of 2.75 m - 3.00 ms. would be more adequate. In the same manner an area of 7.00 sq. ms. - 76 sq. ft. would not be quite large enough to allow proper distribution of furniture and space for movement within the room. A minimum floor area of 8.00 sq. ms. - 87 sq. ft. would be more adequate for a single adult. However, an area of 8 sq. ms could be allowable for a child's bedroom. A minimum area of 9.00 sq. ms - 97.00 sq. ft. for an adult bedroom would be considered as more desirable, with a minimum width of 2.75 ms - 9 ft.

A bedroom for the occupancy of two adult persons naturally needs more area than that of a single person. Furniture required for two people, plus space needed for circulation within the room, requires more area. So a minimum floor area of 8.00 - 9.00 sq. ms. will not be sufficient. An area of 10.00 sq. ms. - 110 sq. ft. as minimum, with the least width of room 3.00 ms. - 10.00 sq. ft. might be more satisfactory; however an additional square meter, totalling an area of 11.00 sq. ms. - 120.00 sq. ft. would be more desirable. This will exceed the desirable minimum area of the single bedroom by 2.00 sq. ms. In the same manner, the master's bedroom requires more area, as

the lady needs more space for dressing and powder corner. A total area of 12.00 sq. ms. - 130 sq. ft. could be a desirable minimum.

More thorough analysis of space requirements and types of furniture, and the layout of the room will help establish more accurate figures. However, this is not an easy task, as certain unknowns always arise; who will occupy the room? what type of furniture will be put in it? and how will it be arranged? It is hard to give a definite answer to such questions. Uncertainty about such matters might cause overlapping of the effective use of space and add extra cost.

The Living Room

The living room may take many forms: living-dining, living-playing (children), living alone. The size of the living room will be affected according to each of these types. What affects the size too is the type and number of occupants. It is evident then, that it is difficult to set measures for size. The area which is sufficient for five people, three of whom are children differs from the size for five adults. However, growth of children, and the process of change should be considered, as the family cannot change residence every time a child becomes an adult.

Another factor in determining the area of the living room is the availability of outdoor living conditions during most part of the year, through the use of open air terraces and verandahs, and courts.

A good way of determining the size of the room is to make a functional layout of furniture needed according to the required space and number of people to be in the room, including

some extra space for visitors.¹ This in turn requires a study of the furniture, its size and types.

For an average family size of 5.5 persons, the area required could be roughly estimated. A living room without dining space must have enough space for the family to undertake certain activities, such as talking, playing cards, listening to radio, or reading. Also space is needed for free and unobstacled circulation. A room of an area 20 sq. ms. - 218 sq. ft. with 4.00 m. the least width seems to be satisfactory for satisfying the space needs of the average family.

Two things are kept in mind here, in deciding on the previous figure:

1. The furniture to be provided is of moderate and simple type, and it is minimum in number, as the middle and low income families cannot afford to pay for plenty of furniture.
2. The availability of outdoor terraces, during most part of the year, which allows outdoor living, at a lower cost.

20 sq. ms. could be considered as desirable minimum required, in addition to a terrace or verandah of minimum 8 sq. ms. However, 18.00 sq. ms. could be tolerated in terms of space, plus an outdoor terrace area of 6.00 sq. ms.

Naturally, additional space will be needed for dining space in the living room. If a separate dining room is provided for the family of 5.5 persons an area of at least 10.00 sq. ms. will be needed, including space for two guests. If the dining space is provided as a part of the living room, less space

1. Eugene Klaburn, Housing Design, p. 35.

would be required. An area of 8.00 sq. ms. would be sufficient; however, the total area depends upon the exact number of people sitting at the dining table.

These figures given here cannot be used as rigid minimum figures, or as good desirable minimum. More analysis of space requirements, furniture, family habits, and cross-sections are required. However, the given figures in the opinion of the writer could be recommended as being quite close to the minimum desirable requirements.

The Kitchen

The primary function of the kitchen is food preparation and servicing. What determines the size of the kitchen is the number of people served and the type of cooking facilities used. The lack of modern kitchen equipment, and the inability of the middle income people to provide modern cooking instruments renders cooking more difficult and requires more space to allow free movement and circulation of air to remove cooking odors and smell which the oriental kitchen evolves due to the nature of food cooked. Careful consideration should be given to the area required when designing. The hot climate adds to the heat of the kitchen.

The size of the kitchen for the average family requires extra space than what the equipment really needs for reasons that have been mentioned. This involves some extra cost factor. An area of 9.00 sq. ms. - 98.00 sq. ft. would be satisfactory with a minimum width of 3.00 ms. An area of 11.00 sq. m. - 120.00 sq. ft. would be more desirable. It would provide enough space for some more activities such as washing. The aver-

age family cannot afford a laundry room.

No matter how big the family is, that is if it is less than five persons, reducing the area of the kitchen according to the size of the family, to a minimum of 6.00 - 7.00 sq. ms. would not be recommended even though the family size does not require extra space. This is to maintain a healthy and clean kitchen under the conditions that have been mentioned.

4. Height of Rooms

The height influences both the psychological well-being and the thermal comfort of the occupants.¹ In determining minimum ceiling height certain factors should be taken into consideration as the height affects the cost of construction and cost of heating. For such reasons ceiling heights have been reduced in many countries to a minimum of 2.70 ms. - 9.00 ft. This would be invalid in Jordan, for the difference of climate.

In the dwelling it is necessary to maintain a thermal environment which will avoid undue heat loss from the human body and which will permit adequate heat loss from the human body.²

The hot climate of the country (dry heat) requires a higher level of ceilings, to maintain more volume of air. A minimum height of 2.70 ms. - 9.00 ft. would be insufficient. In order to attain the two factors mentioned above, higher heights should be adopted regardless of cost to insure a comfortable atmosphere inside the room. Moreover, the height will vary according to the type and function of the room.

1. APHA, Planning Home for Occupancy, p. 44.

2. APHA, Basic Principles of Healthful Housing, p. 1-2.

In such a case a minimum height of 2.90 ms. - 9.6 ft. would be more satisfactory. A mere desirable height would be 3.10 ms. - 3.20 ms, which will give better atmosphere, but the cost factor will increase. However, such calculations need more scientific studies, as to the amount of air needed, and the effect of height on human psychology.

IX. SIZE OF DWELLINGS

The size of the dwelling unit will vary according to the size of the family. The total floor area will depend upon the number of the occupants.

The determination of basic standards for habitual floor space required in a building has undergone many studies. It is difficult to set unit standards, as conditions differ in the same country and from country to country. They differ in geography, in social conditions, and in climate. Aside from the floor area, the size of the building lot comes second in importance.

Six basic criteria are suggested for dwelling space.¹

1. a dwelling unit for each family
2. provision for household activities
3. provision for suitable conditions for temperature and light
4. provision for sanitation and health
5. provision for protection against accidents
6. provision for privacy and personal satisfaction.

These important elements should be provided in a satisfactory minimum area.

1. Minimum Area Required for the Average Family Size

Assuming the family size to be 5.5 persons, the average family will require three bedrooms at least: master's bedroom, a second bedroom for two adults (assumed of same sex) and a third bedroom. In addition a living room, dining space, bathroom and toilet are required. Total area of the house would be:²

1. APHA, Planning Home for Occupancy, p.7.

2. Areas have been assumed by the writer from his experience in architecture. The department of public works has not yet set such standards. The writer also feels that the assumed areas are approximately close to required areas.

ROOMS	MINIMUM AREA	MINIMUM DESIRABLE AREA
Master's bedroom	12.00 sq.ms.	14.00 sq.ms.
Second bedroom	10.00 "	11.00 "
Third bedroom	8.00 "	9.00 "
Living room and dining	20.00 + 8.00	22.00 + 10.00
Kitchen	9.00 "	11.00 "
Bath	2.50 "	3.00 "
Toilet	1.50 "	1.80 "
Hallway	3.00 "	3.00 "
Corridor	2.00 " varies	2.00 " varies
Walls	3.00 "	3.00 "
<hr/>		
Total Area	79.00 sq. ms.	90.00 sq. ms.
	861 sq. ft.	980 sq. ft.

* Saloon:

It is customary in Jordan communities to have a separate extra room for guest reception. It is not used for sleeping. This extra room which is not used by the family, and which is exclusively for guests, adds extra cost. The writer is in favor of not considering that room in the dwelling unit, in other words to cancel it.

* Bathroom:

The size of the bathroom will depend upon the fixtures in it. A bathroom with a bathtub, a heater, and a sink will require a minimum area of 2.5 sq. ms. with a minimum width of 1.5 ms. An area of 3 sq. ms. would be more desirable.

*Toilet:

It is customary in Jordan to have the toilet separate. This will require a minimum area of 1.5 sq. ms. with a minimum width of .90 ms. An area of 1.8 sq. ms. would be preferable.

* Open air terraces and verandahs are not taken into account within the area.

* Areas of hallways and corridors are variable according to design.

2. Minimum Area Required to Accomodate a Family of Four Persons

Assuming a family of four people, parents, and two adults of opposite sexes, the rooms required will be three bedrooms, living room with dining space, bath, kitchen and toilet.

ROOMS	MINIMUM AREA	DESIRABLE AREA
Master's bedroom	12.00 sq. ms.	14.00 sq.ms.
Second bedroom	10.00 "	11.00 "
Third bedroom	8.00 "	9.00 "
Living and Dining ¹	18.00 + 8.00 "	20.00 + 38.00 "
Kitchen ²	9.00 "	10.00 "
Bath	2.50 "	3.00 "
Toilet	1.50 "	1.80 "
Hallways, corridors	3.00 (varies)	3.00 (varies)
Walls	2.50 "	2.50 "
Total	74.50 sq.ms.	83.00 sq.ms.
	820 sq. ft.	905 sq. ft.

*Variables in this type of house are the living room and kitchen. Bedroom areas would obviously vary as occupants are single persons.

1. The area of living-dining is cut down to minimum.

2. The area of the kitchen is cut down to allowable minimum.

3. Minimum Area Required to Accomodate a Family of Three People

Assuming a family of three people, parents and an adult, two bedrooms will be required in addition to the other rooms.

<u>ROOM</u>	<u>MINIMUM AREA</u>	<u>DESIRABLE AREA</u>
Master's bedroom	12.00 sq. ms.	14.00 sq.ms.
Second bedroom	8.00 "	9.00 "
Living-dining	16.00 + 8.00	18.00 + 8.00
Kitchen	9.00 "	10.00 "
Bathroom	2.50 "	3.00 "
Toilet	1.50 "	1.80 "
Corridors, walls	3.00 (varies)	3.00 (varies)
<hr/>		
Total	58.00 sq.ms.	67.00 sq.ms.
	632.00 sq.ft.	730.00 sq.ft.

It is noted here that although the number of the family decreased, the only variable is the living-dining.

In all of the previous examples, certain accessories, such as garages, laundry room and storage were not taken into account.

The previous analysis and assumptions of the areas of the different rooms and dwellings present data which could be regarded as representing the family needs of low and middle income groups in terms of space. However, the type of house was not specified. These figures could not be taken as fixed rigid figures, because even in determining such standards on a more scientific method, flexibility would be necessary. However, the previous figures could be accepted as minimum, representing the basic space requirements.

4. Design Requirements and Space Organization of the Dwelling

The general objective in planning a house is to provide for the family certain basic requirements. Convenience of activity performance and convenience of living and safety are of primary importance. A house or a dwelling unit must preserve health and comfort of its occupants. It must provide an adequate framework for the fulfillment of the daily activities of life.

In planning for safety, the home requires it to be so designed to avoid factors causing accidents, hazards, falls, etc. so escape and service entrances are necessary. Stairs, rails, and floors that cause accidents usually should be designed to suit people of different ages.

The function of home as a shelter requires the right orientation to provide adequate lighting and thermal environment. Cross ventilation and exposure to prevailing breeze is necessary for air circulation within the house.

Assurance of flexibility and livability is required in the design. Flexibility to minor alterations, to meet some of the family changing needs for space, is important. At the same time livability of the house should be insured in terms of adequacy of function, aesthetic values and proper sanitary facilities.

Durability of the building is important. The building should last long enough to overcome its cost and maintenance. Materials used should be hard resisting rigors of climate.

Space organization of the dwelling, with proper distribution of rooms according to function insures convenience of

circulation, privacy of rooms, and convenience of activities. Overlap in function and in circulation should be avoided.

Rooms must be large enough and must provide privacy and quietness. Adequate space organization should perform the correct relationship of the different elements of the dwelling. Total space provided should meet space requirements of the family within its economic ability. All rooms should be large enough and of proper shape to allow good distribution of furniture.

In trying to apply these principles in the design of the dwelling many factors will influence the design. For example the question of hygiene will be affected by the habits of people, their economic possibility for inclusion of sanitary facilities. Safety within the house will be endangered by faulty use of material or abuse of the occupants resulting from ignorance.

5. Minimum Lot Sizes, Courts, Yards

Lots for building should vary in size to allow variety in dwelling sizes. However, the area should not go far below minimum standards to allow for enough space for building and for yards and garden. The size of the lot will vary according to the area of open space to be left. A governing factor in that respect is water. Economy is another factor governing lot size. Generally in most of the urban areas in Jordan, building lots cost almost 1/3 of the construction cost of the house.

Width of lot is variable. Too wide lots will cause length of blocks, streets, and will add to the overall cost. A width of 30 ms. would be reasonable but will cause excessive area, if the average width of a block is 50 - 60 ms. and would be costly. So, a width of 20-25 ms. would be more desirable and more economical.

Minimum width of the lot should insure enough space for building, and space for side yards for the sake of ventilation, admitting light and privacy.

A building line (width) of less than 8 m., -26.5 Ft. would be hard for the designer to handle and would not produce an economical plan. Adding to that a distance of 5 ms - 16.5 ft.¹ as a minimum for side yards will give us a total width of 13 ms-43 ft., which could be considered as a desirable minimum width of the lot.

Depth of the lot will determine the depth of the block, which in turn will vary according to the area of the lot. Economic depth of the block will range from 40 - 60 ms., - 132 - 198 ft.; this will determine too an economic depth of the lot. A minimum depth of 20 m. with the minimum width of 13 ms. will give us an area of 260 sq. ms. A depth of less than 20.00 ms. will cause too narrow blocks resulting in uneconomical cost. Also going above that figure as a minimum requirement will be too high a price as urban land is expensive. A desirable depth of the lot in general would be 20 - 25 ms, which will insure enough open yards, and will make the width of the block within the reasonable range, saving in street lengths and sewer lines. This assumed area is for the detached dwelling. Areas for other types of dwellings will vary.

In the case of row houses (enclosed court row houses), the width of the lot will decrease due to the unnecessary side yards. In this case a minimum lot width of 9.00 ms. - 29.00 ft. will be adequate. But depth of the lot will change. Maintaining

1. See side yards, p.67

of houses, which are used to obtain higher densities, a lot coverage of 35% could be tolerated as minimum. In this case, the minimum lot area would be:

$$\text{Minimum } 79 \times \frac{100}{35} = \underline{225.00} \text{ sq. ms.} - \underline{2450} \text{ sq. ft.}$$

$$\text{Desirable } 90 \times \frac{100}{35} = \underline{257.00} \text{ sq. ms.} - \underline{2800} \text{ sq. ft.}$$

In the case of apartment buildings, the procedure is different. A coverage of 30% might be adequate for buildings up to four stories, but as buildings get higher, increasing the density, land coverage should be reduced to a range of 30% - 20% to allow more open space for the increased families.

b. Courts, yards, setbacks

Yards and set backs are necessary to insure air, sunlight, daylight, and privacy. Space governed by daylight and sunlight will be minimum in Jordan as the sky is clear most time throughout the year. Space required for air circulation and privacy is of more significance. Privacy is very important in the Islamic social heirarchy. Back yards are necessary to provide for service facilities such as laundry and septic tanks. Although septic tanks could be located in front yards, it is preferable to have them in back yards.

Considering the same lot sizes for the average family (260.00 sq.ms.), the required yards and set backs will be as follows:

Side Yards

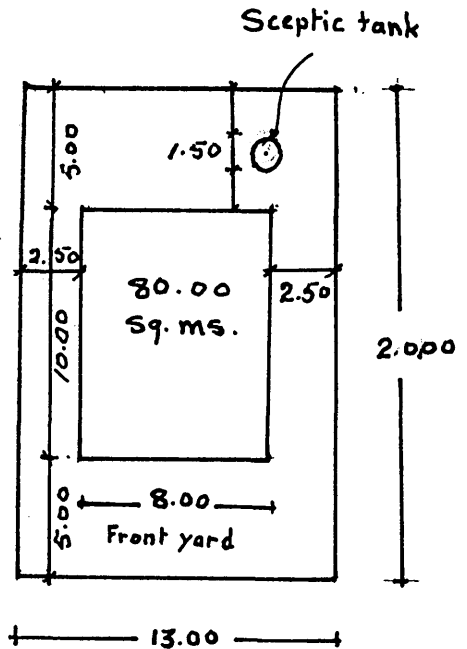
Assuming the minimum lot width 13 ms. and minimum building frontage 8 ms., distance left will be 5 ms., 2.5ms.

as yards on each side. Under the conditions that have been mentioned, a side yard of minimum width of 2.5 ms. will be quite adequate to insure daylight, sunlight, air, and privacy. Although a side yard of 2.00 ms. width will insure the mentioned elements, to reduce noise it would be preferred to have the width 2.5 ms. This minimum would increase as the lot size increases, and according to building coverage specifications. A minimum distance of 3.00 ms. would be more satisfactory, but it will add unnecessary cost.

Back Yard

The back yard is considered as service yard. Septic tanks are usually located in back yards. Minimum width or diameter of septic tank is 1.5 ms.

To avoid seepage of sewage or water, septic tanks should be far from foundations and property lines a minimum distance of 2.00 ms., as shown in the figure. Adding the distances 2 + 1.5 + 2 = 5.5 ms. A minimum distance of 5.00 ms. could be tolerated from property line to building line.



Front Yard

In the previous lot size after deducting side yard, building depth, a width of 5.00 ms. remains as a front yard. This is quite far enough set back from the street to obtain privacy and reduce noise. The setback, however, will depend on the width of the street, overall size of lot and building coverage. But a distance of 5.00 ms. is quite adequate as

minimum allowable setback. A distance of 4.00 ms. also as minimum could be acceptable.

Setbacks for one story court-yard row house is often neglected in some neighboring countries. The writer feels that there should be a setback to insure privacy, as house walls built right on the street line cause inconveniences.

The figures given here do not represent the exact required numbers. However, the writer recommends such numbers as meeting the minimum adequate requirements to insure healthful conditions.

X. DENSITY OF RESIDENTIAL DEVELOPMENT

1. The Function of Residential Density

Density may be defined as the ratio between a given area of land and the number of dwelling units in the same area, or the number of people in the area. Density calculation in physical planning is necessary to determine this relationship between land and number of people, and also to estimate the land needed to house certain numbers of people.

Density standards are worked out to provide or to protect health. To control overcrowding, and to distribute people according to cost of land and its adequacy and to encourage its rational use are the purposes of density standards. They are used too as measures for daylight, air and openness. Density standards are made to insure that in new developments certain standards are obtained, or in the case of existing development, to convey an idea of present standards.¹

2. Measures of Density

Population density is expressed as the number of persons (or families) per acre of land, or as acres of land per 1000 people. Dwelling density is expressed as the number of dwelling units per acre of land, or the number of acres of land per dwelling unit.²

Floor area ratio is the total floor area of all stories used for residential purposes, divided by the area of residential land.³ The ratio is used as a density control.

Net dwelling density is the number of dwellings per acre of net residential land - land devoted to residential buildings,

1. Ministry of Housing, London. The Density of Residential Areas, p. 2.

2. APHA, Planning the Neighborhood, p.37. 3. Ibid. p.40.

and accessory uses on the same lot, such as drive-ways, service areas, but excluding land for streets, playgrounds, parks, and non-residential buildings.¹

Gross density is the number of dwellings per acre of land, including all the elements mentioned above.

3. Criteria for Determining Density

In determining density standards, it is a significant matter to relate it to the living conditions. It is necessary to understand the essential needs of the family that must be provided in the residential area, including housing, open spaces, and all other public facilities.

Certain factors govern the development and provision of such needed facilities:

1. Health - health factor governs number of dwellings and spacing between them to allow adequate light and air.
2. Cost² - cost factor affects density. To insure most economic return on land of high value requires high density.
3. Social - privacy and openness affect density.
4. Public facilities - affect density as to provision of land for schools, shops, etc.

Acceptable density figures can be established within a wide range. Variety in density must be based on the principle of providing all people with those amenities that are deemed essential to good living in urban areas.³

1. APHA, Planning the Neighborhood, p.37.

2. Cost factor is not really an important governing criterion. It is a result and not a means.

3. A.S.O.P.O. Planning 1957, Simon Eisner, p.123.

4. Net Dwelling Densities

The following table will show net dwelling densities according to the average family size of 5.5, minimum lot area for the average family, and building coverage. It is assumed in this table that the average family size for the walkup two and three stories is 4.00 persons, as it is suggested that families living in such type of housing would be smaller in size owing to the difficulty of climbing stairs for children and old people.

Dwelling Type	Lot Area		Built-up Area		Lot Coverage, Building Coverage	Units/Acre of Net Residential Land	
	Min. Sq. M.	Desirable	Min.	Des.		Des.	Max.
<u>One-two family with individual access.</u>							
1-family detached	260	300	79	90	35%	13	15
1-family semi-" ¹	235	275	79	90	35%	14	17
1-family attached	230	270	79	90	35%	15	18
2-family detached	260	300	79	90	30%	24	30
2-family semi-"	235	275	79	90	30%	26	34
<u>Multi-family</u>							
2 story walk-up	220	240	74.50	83	35%	34	37
3 " "	250	265	74.50	83	30%	45	48

1. A side yard of an area of 25.00 sq. ms. is deducted.

The following table shows net dwelling densities according to average figures.

Dwelling Type	Lot Area Sq.M.	Built-up Area Sq. M.	Build. Coverage	Units/Acre of net residential land Des.	Max.
1 family detached	280	85	35%	11	14
1 " semi- "	250	85	35%	13	15
1 " attached	250	85	35%	14	16
2 " detached	280	85	30%	24	28
2 " semi-"	255	85	30%	26	30
2 story walk-up	230	80	35%	30	34
3 " walk-up	265	80	30%	40	45

It is assumed that families living in multi-family walk-ups average four people.

5. Building Coverage

Building coverage is the proportion of area net or gross occupied by the building in a lot. It is a good tool used to regulate open spaces around buildings to insure openness for air, daylight, sunlight and privacy.

In the previous analysis for minimum building area, lot size, and yard arrangements a building coverage of 30% - 35% was assumed. This percentage allows, as has been shown, enough open space to insure elements of health mentioned above. A coverage

of 30% would be more desirable than 35%, however 35% could be applied to detached dwellings without sacrificing much open space.

A building coverage of 25% will insure more open space, but for 1 - 2 family development it would be uneconomical to apply it. However, it could be used freely for lot sizes bigger than the specified areas herein as minimum and desirable. Also, in high density developments of four to six stories a coverage of 25% is adaptable.

XI. DENSITY IN RELATION TO THE NEIGHBORHOOD

Neighborhood density is the ratio of population to the total neighborhood land area, including all land used for neighborhood purposes, but excluding non-neighborhood land uses, or unusable land within the neighborhood boundaries.¹

Gross density will be the unit of measurement for the estimation of total land required to accommodate a group of people in a neighborhood providing all the necessary facilities. The amount of land required therefore will depend upon the densities of the different facilities in the neighborhood.

1. Effect of Dwelling Types on Neighborhood Density

Neighborhood density increases as net residential density increases without violating standards of healthful environment.²

A neighborhood of 6,000 persons, accommodated in single family houses will require more area than if the same number of people were housed in two-family or single-family row houses. On the other hand as residential densities increase, more area for public facilities is required, and also for open spaces. This shows that as dwelling types change, the density of the neighborhood increases. But the proportion of increase gets less as the increased number of families require proportionately more area designated for public uses.

2. Effect of Density on Public Facilities

Neighborhood density affects in terms of area the different facilities in the neighborhood, such as schools, open spaces, shops and streets.

1. APHA, Planning the Neighborhood, p. 63.

2. Ibid., p. 66.

a. Schools

In order to determine the amount of land needed for a school, the number of school children must be known. As has been mentioned earlier for sex segregation in education two school sites are needed, each of a capacity of 360-420 pupils.

The area required for an elementary school is calculated according to the area required of the following elements: area of class rooms, administration rooms, auditorium, playgrounds and playfields (playfields consist of basketball and soccer fields). The area of the fields is calculated to the minimum as it is difficult to keep them green. The area for such a school is estimated to be 10.00 dunums - 2.5 acres, and an additional area of 5.00 dunums - 1.25 acres for playfields.¹ It adds to a total of 15.00 dunums - 3.75 acres for each elementary school of a capacity of 360-420 pupils. In the same manner the area required for a kindergarten of 100-150 pupils, is found to be 3-4 dunums - @ 1.00 acre). Adding the total area of two elementary schools and a kindergarten for the neighborhood of 6000 people we get 15+ 15 + 4 = 34 dums, or 8.50 acres.

Schools	Number	Pupils		Area dunums	
		Each	Total	Each	Total
Elementary School	2	360- 420	720- 840	10	20
Playgrounds	2			5	10
Kindergarten	1	120	120	4	4
Total				34 Dunums	

34 Dunums = 8.50 Acres

1 Dunum = 1,000 sq.m.

1 Acre = 4.046 Dunums

1. Appendix A, p. 6.

The total area of 8.25 acres is for 5600-7050 people. Taking 6,000 as an average the area for schools per 1,000 people would be 1.38 acres or about 1.4 acres. As the number of pupils per class or per school increases, the area of 1.4 acres per 1000 people will increase.

b. Open Spaces

Open spaces include parks, and playgrounds for organized games. Density and number of people are governing factors in determining area required for open space. In Jordan water is another governing factor.

As net residential density and gross density decrease, that is, the private lot open space increases, the area required for public open space decreases. Similarly, an increase in net residential area should be followed by increase in public open space.

The area required, again, will vary according to the nature of the locality. A community with natural amenities does not require much open space. The ratio of open space varies too according to the percentage of child population.

"A minimum standard for recreational space was adopted on the basis of various studies made by recreation authorities. These indicate that a reasonable minimum standard for passive and active reereation in a neighborhood dependent on public recreational facilities and with normal population characteristics would be at least 2 acres per 1,000 persons and probably more."¹

In the case of Jordan such an allowance might be considerably high, regarding cost of land, maintenance and water

1. F.J.Adams, "Density Standards for Multi-Family Residential Areas", p.3.

problem. An allowance of 1 Acre/1000 people might prove to be practical, supplemented with private playground and school play grounds.

In the neighborhoods of 6,000 people, a total area of 6.00 acres will be needed, added to the other supplementary areas. This number could be distributed between the playground, and local parks in the following way:

4.00 Acres for the playground.

2.00 Acres for neighborhood parks.

It is assumed here that the neighborhood is of 1-2 family developments, and structures of three story walk-ups, and it is not of multi-family development.

c. Neighborhood Shopping

As the required area for neighborhood shops is small, it would be relatively less affected by residential density. The type of shopping that is common in Jordan is that which is accommodated in the first floor of a residential building, while the upper floors are used for residence. Parking space required is of no problem, except that provision of space for delivery and service is required.

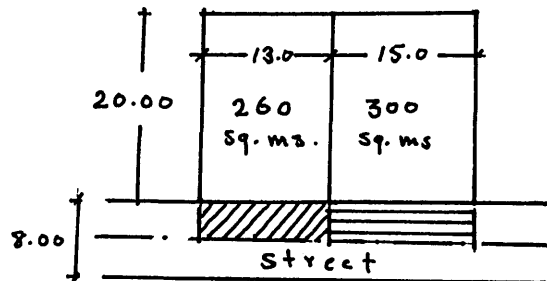
An area of .25 acres/1000 people could be quite adequate for shopping facilities, including circulation area, delivery and service area. A total of 1.5 acres for a neighborhood of 6,000 would be adequate. However, this figure could be reduced to one acre allowing in certain definite areas the use of the ground floor of a residential building as shops, following the same pattern which is existing now. However, this is

not recommended except in areas designated in the land use for shopping.

d. Neighborhood Streets

As residential net density decreases, space for streets per family increases and total percentage of land developed for streets increases. The minimum street area per the average family would be:

Dimensions were given in lot size,



Assuming the minimum lot size for the average family 260.00 sq. m., and a lot size area of 300.00 sq. m. as more desirable, and minimum width of street 8.00 ms. to allow two cars to circulate and for side walks, then the minimum street area per family would be:

1. $13 \times 4 = \underline{52 \text{ sq.ms.} - 567 \text{ sq.ft.}}$

2. $15 \times 4 = \underline{60 \text{ sq.ms.} - 654 \text{ sq.ft.}}$

This is in the case of a single family dwelling; in the case of two family dwelling, obviously, the area would be half. However, the street area depends on the type of density and type of streets. In the case where pedestrian walks and steps are used, the area required will be $\frac{1}{2} - \frac{1}{4}$ of the above mentioned areas. The area required per family will be evidently less in the case of single family row house, or two-three walkup story houses.

CONCLUSIONS

Now that standards have been set, we must face up to the reality that at the present time and in the foreseeable future it will not be possible for individual private enterprise in Jordan to meet these standards. Since standards of themselves are worthless unless they can be put into effect, we must seriously consider this problem - this apparent conflict between what we would like to see happen and what private enterprise as it now operates in Jordan can in fact achieve. Several points seem to suggest themselves here:

I. Construction plans, subdivision, schools, etc. should be permitted only if they do meet the standards set out here. Of course, in a case of absolute necessity, it may be required to permit some slackening of these standards at first. However, where at least a small portion of private enterprise can accomplish the standards, this must be insisted upon. At least as nearly as possible private construction in Jordan should be brought up to the level of these standards.

II. Establishment of a Central Planning Agency, local planning departments, at the same time strengthening the present Departments of Public Works and Building in each city government - this would provide a mechanism for controlling, directing, enacting zoning ordinances, building codes to help put into effect the standards.

III. The Central Government should take one of two methods of approach or more possibly a combination of both:

a. The Government itself should establish a national housing authority which would put up housing for low and middle

income groups among the population.

b. The Government should subsidize private enterprise so that it might construct housing at an income level to meet the need of the low and middle income section of the population. One method to be used might be a rent write-down facilitates via direct subsidy to the builder.

IV. As in most countries, but particularly in developing countries (where social and planning research on a national scale is just beginning), there is urgent need for more study and survey of the housing and public utilities situation in Jordan. I have in mind two special areas:

a. A social survey. This needs to be made encompassing the whole scope of the national life. Jordan is a relatively new nation. There is not available enough material on the traditions, economic conditions, everyday problems and needs of the population. With such a basis of research, it would be easier to project development goals and standards.

b. A housing survey. Here, as elsewhere in the world, there is need for up-dating knowledge of such items as material availability, shortages, cost; types of construction possible in the Jordanian environment; tradition; number, size and composition of the Jordanian family; standardization possibilities and methods for reducing the cost of construction. Such research and survey on a comprehensive, professional and continuing basis are necessary if we are realistically to evaluate and suggest solution to the problems presently facing the country. Only with such background can a development program of the Central Government be built up to the point where such standards as I have suggested can be achieved or better standards be worked out for the future.

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APPENDIX A

THE PLANNING SCHEME FOR
THE WADI SEER GARDEN CITY NEIGHBOURHOOD

PROPOSED BY

DR. ALI ADIBI

U.N.T.A.A. TOWN PLANNING EXPERT, JORDAN

AMMAN, October 1957.

A BRIEF NOTE ON THE PROPOSED SCHEME FOR
THE WADI SEER GARDEN CITY NEIGHBOURHOOD

by Dr. Ali Adibi

U.N.T.A.A. Town Planning Expert, Jordan

Acknowledgement

This scheme has been prepared with the full participation of Mr. A.M. Dakhgan, architect, Mr. Joma Rashid, draftsman, and Mr. Yousef Safadi, draftsman, all attached by the Municipality of Amman to the Office of the U.N.T.A.A. Town Planning Expert.

1. SITE:

This neighbourhood is the westward extension of Jabal Amman. It occupies a narrow strip of land, approximately 1500 dunums in area, between the fourth circle roughly 450 meters west of the Zahran Palace and the Municipal boundary on the west. In the north and south the area is bounded by Wadi Seer and Wadi Abdun respectively.

2. Existing Condition:

a. Considering the natural setting and the land values the Wadi Seer neighbourhood could be considered as one of the high-income residential areas.

b. Although no plan has ever been attempted for this neighbourhood, the area has been arbitrarily divided into large parcels presumably along some anticipated street pattern. This, however, has been done by the individual landowners in an unrelated manner and with no concern to a common pattern.

c. There is only one house built in this area fronting the Wadi Seer Road.

d. The extension of Wadi Seer Road, which links the whole of Jabal Amman to the central area of the town on one side and to the Wadi Seer Village on the other, passes through this area. This is, at present, the only access road to this area.

3. Proposed Scheme:

a. Name: For the future references it is proposed to identify this area as "THE WADI SEER GARDEN CITY". This is an appropriate name since the garden-city type of houses is anticipated and proposed in this area.

b. Land Use:

This area is almost absolutely undeveloped. It, therefore, lends itself more to a proper planning than most of the other residential areas. The only limitations are: (1) the Wadi Seer Road which bisects the area. Since the area and the anticipated population rule out the possibility of two-neighbourhood scheme full advantage has been taken of the Wadi Seer Road by using it as the main boulevard of the neighbourhood, and (2) the unplanned and illogical parcelation which out of necessity has not been taken fully into consideration.

Thus the land has been allocated for the various areas as follows: (See following page)

	Area in Dunums	Percentage of Total
Residential	779	53
Roads	394	27
Public open space	206	14
Community Facilities	91	6
Public buildings	(39)	-
Schools & Nurseries	(38)	-
Shopping	(14)	-
<hr/>		
TOTAL NEIGHBOURHOOD	1470	100

c. Residential:

The residential areas occupy approximately 780 dunums or about 53% of the total area of the neighbourhood. Following the general zoning scheme proposed for the whole city, mainly two zones are recommended for this neighbourhood with the following break down:

AREAS AND POPULATION OF RESIDENTIAL ZONES

WADI SEER GARDEN CITY

Zone	Area in dunum	Percentage of Area	Approx. Ultimate Population
A	350	45	1750
B	430	55	4300

For the city-wide zoning scheme see the attached chart.

At the proposed zoning the neighbourhood will accomodate

350 single family houses and 430 two family units. Assuming an average family size of 5, the neighbourhood will house a population of about 6000.

Considering the topography of the area the proposed zoning will provide the maximum view of the surroundings for all the houses.

d. Road and Streets:

The roads and streets roughly take 27% of the total neighbourhood area. The two bypass roads flanking the neighbourhood are the extensions of the ones bypassing the Zahran Garden City Neighbourhood. Because of the topographical difficulties these bypass roads do not join the major boulevard or the ring road within the neighbourhood. The only two connections are on the west and northwest of the area.

The neighbourhood, in its simplified form, is equipped with a ring road, an east-west boulevard and a northwest-south cross-neighbourhood street. This network not only links all parts of the neighbourhood, but also brings the residents conveniently in contact with the various neighbourhood facilities. The width of all roads and streets are indicated on the zoning map. However the following table is provided as a general guide:

WIDTH OF THE ROADS AND STREETS

WADI SEER GARDEN CITY

Kind of Road or Street	Width in Meters
Bypass road and boulevard	20
Ring road and cross neighbourhood street	16
Collector streets	12
Minor streets	10

e. Schools and Nurseries:

The numbers of schools and nurseries required in this neighbourhood are calculated on the basis of the following table:

ASSUMED FAMILY SIZE AND AGE DISTRIBUTION - AMMAN

1. Average size of Family 5
2. Age distribution of children served by neighbourhood school and play areas.

Children by School Age Groups:

	Children per 1000	Children per Family
N.S.		
2½ -4 (2½)	50	0.25
Kindergarten		
5 (1)	20	0.10
Six-Grade P.S.		
6 through 11 (6)	120	0.60
Children by Play Age Groups		
Playlot		
2½ through 5 years (3½)	70	0.35
Playground		
6 through 13 (8)	160	0.80

It is assumed that there are 20 children per 1000 persons per year of age.

Thus the number and areas of schools and nurseries would be:

SCHOOLS AND NURSERIES

WADI SEER

INSTITUTIONS	NO.	PUPILS		AREA IN DUNUMS	
		EACH	TOTAL	EACH	TOTAL
Primary Schools	2	400	800	10	20
Playgrounds	2	-	-	5	10
Nurseries	2	150	300	4	8
TOTAL AREA					38

Because of the sex-segregation in education system in Amman the two schools, one for each sex, are so located to be conveniently reachable from all parts of the neighbourhood. The two nurseries are also proposed to be adjacent to the two schools. A site on the northeast has been proposed for a secondary school

f. Shopping Centers:

An area of about 14 dunums has been earmarked for the main shopping center. This site would provide adequate area for shops, a small cinema, places of worship, parking areas, etc. Aside from this, two smaller-sites in the south-eastern and north-western parts of the neighbourhood, are proposed for subsidiary shopping centers.

g. Open Areas and Public Places:

Aside from a green belt which would serve as a buffer zone between the bypass roads and the residential areas certain number of open spaces have been proposed in conjunction with the neighbourhood facilities. A site for a community center has also been located adjacent to the main shopping center.

4. Utilities and Service:

The plan submitted for this neighbourhood has been prepared taking into consideration the limitations and possibilities of all the necessary utilities and services. However it should be noted that a detail scheme for the substructure of this neighbourhood dealing with such aspects as water supply network, sewage system, lighting, etc. would be essential for implementation of the plan after it is adopted.

APPENDIX B

ZAHRAN NEIGHBORHOOD

The drawing shows a plan of a neighborhood of high income group, in the outskirts of the city of Amman. At the time the plan was prepared the site was relatively vacant, except for the few buildings shown on the plan. This plan has been carried out in its orderly shape. Now most of the eastern section of the plan has been developed. It shows a healthy growth of a well planned neighborhood.

ZAHARAN NEIGH.
BORHOOD



SCHEDULE FOR
 ZAHARAN GARDEN CITY
 ZAHARAN
 ZAHARAN
 RESIDENTIAL
 RESIDENTIAL AREAS
 SPACES
 L
 NURSERIES
 2500
 PLANNING EXPERT

مشروع تنظيم
 مدينة زمهران
 محمد عثمان الاذن
 مناطق السكن العالي
 مناطق السكن المنخفض
 ساحات عامه
 مركز تجاري
 مدارس
 القياس: 1:2500
 تصميم: فيدالتيم الدولي
 الكستر: علي ادريس
 نيسان 1956

رقم المزار تاريخ 1957/4/11
 593 طلعت اللجنة المحلية للتنظيم والاهتمام على كتاب رئيس مهندسي امارة العاصمة
 رقم 1058/1/280/2 تاريخ 1957/6/27 وبعد الدلائل تهرت الموافقة على التنظيم المقترح
 من قبل ائمة الروي الكونز على اديبي واليمين على الخط اع رقم 11536 الذي يحتوي على
 مشروع التنظيم - بين عمان التنظيم في شهر نيسان 1956 مع كافة التعديلات المتعلقة به
 عضو عضو عضو عضو عضو
 رئيس اللجنة للتنظيم والاهتمام

مذكرة المساحة العاصمة

بين المشرق

تنظيم

شعبة القدر والتنظيم

2500

التاريخ

1957/4/11

1957/6/27

1957/6/27

1957/6/27

APPENDIX C

JABEL ELTAJ NEIGHBORHOOD

The plan shows a neighborhood of low and lower middle income groups. It is in the outskirts of the city of Amman. This neighborhood was built during the past decade. Development was not guided by an organized plan; however this rough plan was prepared a few years ago to save what empty space was left, after most of the neighborhood was already built.

This is a good example showing the result of unplanned growth. The street pattern is not following contour lines, in fact there is no street pattern. Building lots are very small, and building coverage reaches 50% - 60% of the lot. There are no school buildings, parks, and playgrounds. Even space required for such facilities was not left. This represents the ill growth of an unplanned neighborhood.



مشروع تنظيم منطقة جبل التاج

منطقة سكنية	[Symbol]
منطقة صناعية	[Symbol]
منطقة تجارية	[Symbol]
منطقة خضراء	[Symbol]
مساحات خضراء عامة	[Symbol]
سورج معبر	[Symbol]
سورج مقفل	[Symbol]

التوسعة

تمت الموافقة على خطة التوسعة في جلسة المجلس البلدي بتاريخ ١٩٥١/١٠/١٠ الموافق ١٩٥١/١٠/١٠
 هذا المشروع التوسيعي لتنظيم منطقة جبل التاج كما هو مبين على هذه الخطة رقم ٤-١
 ١٩٥١/١٠/١٠ تاريخ الخطة ١٩٥١/١٠/١٠ على ان تطبق على الاموال المخصصة لهذا المشروع والحدود بين
 مناطق التوسعة والحدود البلدية.

تم اصدار
 قرار المجلس البلدي في تاريخ ١٩٥١/١٠/١٠ الموافق ١٩٥١/١٠/١٠
 على ان تطبق الخطة التوسيعية رقم ٤-١
 على الاموال المخصصة لهذا المشروع والحدود بين
 مناطق التوسعة والحدود البلدية.

مختار
 مدير
 مدير
 مدير
 مدير

جبل التاج - خريطة
 تنظيم
 ٢٥٠٠٠
 ١٩٥١